

WHAT IS CLAIMED IS:

1. A nucleic acid having a nucleotide sequence encoding a protein having the activity for vacuolar compartmentalization of flavonoids in plant cells, said nucleotide sequence being selected from the group consisting of:

(i) the nucleotide sequence represented by SEQ ID NO:1 or a nucleotide sequence which is degenerate with respect to SEQ ID NO:1;

(ii) a nucleotide sequence which is identical to SEQ ID NO:1 except that it has deletions, substitutions or additions of one or more bases;

(iii) a nucleotide sequence hybridizable under stringent conditions with a nucleotide sequence complementary to the nucleotide sequence represented by SEQ ID NO:1; and

(iv) a nucleotide sequence having at least 60% nucleotide sequence identity to the nucleotide sequence represented by SEQ ID NO:1.

2. A nucleic acid encoding a protein having the activity for vacuolar compartmentalization of flavonoids in plant cells, said protein comprising an amino acid sequence selected from the group consisting of:

(a) the amino acid sequence represented by SEQ ID NO:2;

(b) an amino acid sequence which is identical to SEQ ID NO:2 except that it has deletions, substitutions or additions of one or more amino acids; and

(c) an amino acid sequence that has at least 60% amino acid sequence identity to the amino acid sequence represented by SEQ ID NO:2.

3. A protein that is encoded by the nucleic acid according to claim 1 or 2 and which has the activity for vacuolar compartmentalization of flavonoids in plant cells.

4. A recombinant vector containing the nucleic acid according to claim 1 or 2.

5. A transformed plant cell containing the recombinant vector according to claim 4.

6. A transgenic plant containing the nucleic acid according to claim 1 or 2.

7. A process for producing flavonoids which comprises the steps of cultivating the transformed plant cell of claim 5 in a culture medium or growing the transgenic plant of claim 6 and harvesting a vacuolarly accumulated flavonoid from the cultured transformed plant cell or the grown transgenic plant.